Claims

1. original Method of oxidizing CO in a mixture of gases including oxygen and at least 65% by volume hydrogen comprising passing said mixture of gases through a catalyst bed comprising an unsupported catalyst made by (a) preparing an aqueous iron/gold solution comprising an iron source and a gold source (b) gradually combining said iron/gold solution with an aqueous solution of an alkali metal base to maintain a pH of 7 to 9 in the combined solution as the solutions are combined, thereby producing solids in said combined solution (c) separating said solids from said combined solution (d) washing said solids, (e) drying said solids, (f) grinding said solids to a size range of O.85mm to 4.25mm, (g) calcining said solids, and (h) activating said catalyst by passing a hydrogen and oxygen containing gas through said catalyst for at least 12 hours at a temperature of 60-90°C.

2. original Method of claim 1 wherein said gold source comprises $HAuCl_4 \cdot 3H_2O$.

3. original Method of claim 1 wherein said iron source comprises $Fe(NO_3)_3 \cdot 9H_2O$.

4. original Method of claim 1 wherein step (b) is conducted at a temperature of 50°C to 90°C.

5. original Method of claim 1 wherein said pH is maintained at 7.5-8.5.

6. original Method of claim 1 wherein the hydrogen and oxygen containing gas in step (h) is passed through said catalyst for a period of 12-36 hours at a temperature of 65-75°C.

7. original Method of claim 1 wherein said gold is present in said catalyst as 0.25% to 10% by weight of said iron oxide.

8. original Method of claim 7 wherein said gold is present in said catalyst as 1 % to 3% by weight of said iron oxide.

9. original Method of claim 1 wherein said alkali metal base is sodium carbonate.

10. original Method of claim 1 wherein said mixture of gases comprises 200ppm to 20,000ppm by volume carbon monoxide and at least 10% by volume carbon dioxide.

11. original Method of claim 1 wherein said catalyst has a size range of 1mm to 1.4mm.

12. original Method of oxidizing CO in a mixture of gases including oxygen and at least 65% hydrogen by volume and wherein said CO is present in an amount from 200ppm to 20,000ppm by volume, said gas also containing methane, comprising passing said mixture of gases through a catalyst bed comprising a particulate unsupported catalyst made by (a) preparing an aqueous iron/gold solution comprising an iron source and a gold source (b) gradually combining said iron/gold solution with an aqueous solution of an alkali metal base to maintain a pH of 7 to 9 in the combined solution as the solutions are combined, thereby producing solids in said combined solution (c) separating said solids from said combined solution (d) washing said solids, (e) drying said solids, (f) grinding said solids to a size range of 0.85mm to 4.25mm, (g) calcining said solids, and (h) activating said catalyst by passing through said catalyst a mixture of hydrogen and oxygen in a ratio by volume of about 0.25/65 to 6/65 for at least 12 hours, wherein the gold in said catalyst is present in an amount from 0.25% to 10% by weight of the iron in said catalyst.

13. original Method of claim 12 wherein said gold is present as 1-3% of the weight of said iron.

14. original Method of claim 12 wherein said mixture of hydrogen and oxygen used in step (h) is passed through said catalyst at 60-90°C for 12 to 48 hours.

15. original Method of claim 14 wherein said mixture of hydrogen and oxygen used in step (h) is passed through said catalyst for 24 to 36 hours.

16. original Method of claim 14 wherein said mixture of hydrogen and oxygen used in step (h) comprises hydrogen and 1-5% oxygen by volume based on the hydrogen.

17. original Method of claim 1 wherein said hydrogen and oxygen containing gas used in step (h) includes air as a source of oxygen, at least 65% by volume hydrogen, and 0.25-6% by volume oxygen based on said hydrogen.

18. original Method of claim 1 wherein said hydrogen and oxygen containing gas is passed through said catalyst for 24 to 36 hours.

19. original Method of claim 17 wherein said oxygen is present in said gas at 1-5% by volume.

20. original Method of claim 1 wherein said calcining is performed by heating said ground solids gradually to reach a temperature of 200-500°C within an hour, and maintaining the temperature within that range for at least one-half hour.

21. currently amended Method of oxidizing CO in a mixture of gases including oxygen and at least 65% by volume hydrogen comprising passing ~~siad~~ said mixture of gases

through a catalyst bed comprising an unsupported catalyst made by (a) prepanng an aqueous iron solution from a suitable iron source (b) preparing an aqueous gold solution from a suitable gold source (c) gradually combining said iron solution with an aqueous solution of an alkali metal base to maintain a pH of 7 to 9 in the combined solution as the solutions are combined, thereby producing a slurry of solid in said combined solution (d) gradually combining said gold solution with the slurry while also adding a solution of an alkali metal base to maintain the pH at 7 to 9 in said slurry (e) separating the solids from said slurry (f) washing said solids (g) drying said solids (h) grinding said solids to a size range of 0.85 mm to 4.25 mm (1) calcining said solids and (j) activating said catalyst by passing a hydrogen and oxygen containing gas through said catalyst for at least 12 hours at a temperature of 60-90°C.

22. original. Method of claim 21 wherein said gold source comprises $HAuCl_4 \cdot 3H_2O$.

23. original Method of claim 21 wherein said iron source comprises $Fe(NO_3)_3 \cdot 9H_2O$.

24. original. Method of claim 21 wherein said gold is present in said catalyst as 0.25% to 10% by weight of said iron oxide.

25. original Method of claim 21 wherein said hydrogen and oxygen containing gas used in step (h) includes air as a source of oxygen, at least 65% by volume hydrogen, and 0.25-6% by volume oxygen based on said hydrogen.

26.original Method of claim 21 wherein said mixture of hydrogen and oxygen used in step (h) is passed through said catalyst at 60-90°C for 12 to 48 hours.